

#### REMARKS

The U.S. Patent and Trademark issued an office action dated November 6, 2003. In response to this office action, applicant responds as follows:

In respect to the examiner's objection to the drawings, applicant has modified the designation of the grinding wheel to "40" in both the specification and drawings.

In respect to the examiner's objections to the drawings in respect to contact surface and ring, applicant has modified the claims to better accord with the specification in reciting that the "washer 26" is in contact with the rotors (see spec pg 6 ln 22-pg 7 ln 3) and that this washer contact is within the radial confines of the rotor valley (see spec pg 6 ln 22-pg 7 ln 10). It is believed that these changes meet the examiner's objections to the drawings.

In respect to the examiner's objections of claims 26, 44-48, 54, 55, and 56, applicant has amended these claims to provide for the appropriate antecedent basis as requested by the examiner.

In respect to the objections of claims 24, 49, 51, 56, 57, 59, 60, 61, and 65 as being anticipated by Junker U.S. Patent 5,807,164, applicant believes these claims as presently constituted distinguish over the Junker reference. However, it is noted that the Junker reference relates to two retractable feeler pins which sequentially guide the spindle sleeve of the

workplace spindle head in order to guide the tool in an axial direction (see col 2 lns 1-19). This allows for guidance over the axial length of the tool bin being re-round (col 2 lns 15-19). The actual tool itself is not supported (see Junker fig 2).

In contrast with Junker, in the preferred of the present invention disclosed, the two positioning rolls 84, 85 engage the outer surface apart in order to contact and retain such part in an operative position as well as providing a reference point for the manufacturing operation (8+1/2x11 spec pg 13 lns 19-23; fig 2). This contact retains the rotor in position in respect to the grinding wheel during the manufacturing operation (spec pg 11 lns 17-22; pg 7 lns 13-18). The fissure 80 clamps the rotors in respect to the guiding wheel (spec pg 9 lns 2-4).

To clarify this distinctiveness, applicant has amended the pertinent claims to recite that the location means locates "and retains" the member having external developed surface in respect to a formed grinding wheel. As this construction and function is not present in Junker, applicant believes that these claims now differentiate undeniably over the Junker reference.

In respect to the examiner's rejection of claim 66, applicant is unable to accurately understand this rejection.

Applicant has determined that the inclusion of a "non-circular external developed surface" into the rejected claim 66 would differentiate this claim over any interpretation of Rimlinger U.S. Patent 5,737,985. Applicant has, therefore, made this modification to claim 66.

It is believed that this action places the substantively rejected claims 24, 26, 44-49, 51, 54-57, 59-61, 65, and 66 into condition for allowance.

In view of the above, applicant respectfully requests the examiner's reconsideration of the rejections and view the application into condition for allowance.

Favorable action is solicited.

Respectfully submitted,

William Lightbody  
William S. Lightbody, 29,557

## Appendix

Claims 1-23 cancelled on 12/18/01.

Claim 24. An improvement for an apparatus using a formed grinding wheel to grind a member having an external developed surface with at least two segments,

the improvement comprising means for connecting the formed grinding wheel to the apparatus, a location means to locate and retain one segment of the developed surface with a positioning roll connected to a moveable clamp,

and means to operate the formed grinding wheel to grind a different segment of the developed surface.

Claim 25. An improvement for an apparatus using a formed grinding wheel to grind a member having an external developed surface with at least two segments,

one segment of the developed surface has a valley having a size, the improvement comprising means for connecting the formed grinding wheel to the apparatus, a location means to locate one segment of the developed surface with a positioning roll connected to a moveable clamp,

said location means utilizes a positioning roll a size greater than the size of the valley with the positioning roll having a two point contact with such valley,

and means to operate the formed grinding wheel to grind a different segment of the developed surface.

Claim 26. The apparatus of claim 24 wherein the external developed surface has a developed valley and characterized in that a line from the center of the positioning roll to the different segment through the bottom of the developed valley being ground forms an angle less than  $60^{\circ}$ .

Claim 27. The apparatus of claim 25 characterized in that a line between said two points of contact with the valley is between  $0^{\circ}$  and  $60^{\circ}$  in respect to a segment perpendicular through the center of said positioning roll and the center of said line.

Claim 28. The apparatus of claim 25 wherein the formed grinding wheel has an axis of rotation and characterized in a line extending through said two points of contact of the positioning roll with the valley intersects the axis of rotation of the formed grinding wheel at an angle of between  $30^{\circ}$  and  $60^{\circ}$ .

Claim 29. An improvement for an apparatus using a formed grinding wheel to grind a member having an external developed surface with at least two segments,

the improvement comprising means for connecting the formed grinding wheel to the apparatus, a location means to locate one segment of the developed surface with a positioning roll connected to a moveable clamp,

said locating means utilizes two or more positioning rolls,

and means to operate the formed grinding wheel to grind a different segment of the developed surface.

Claim 30. An improvement for an apparatus using a formed grinding wheel to grind a member having an external developed surface with at least two segments,

the improvement comprising means for connecting the formed grinding wheel to the apparatus, a location means to locate one segment of the developed surface with a positioning roll connected to a moveable clamp,

said locating means utilizes three or more positioning rolls,

and means to operate the formed grinding wheel to grind a different segment of the developed surface.

Claim 31. The apparatus of claim 25 characterized in that said locating means utilizes two points of contact established by two different positioning rolls.

Claim 32. The apparatus of claim 25 wherein the member is a rotor and characterized in that said locating means utilizes a segment line running through the two points of contact substantially perpendicular to a line running from the center of the rotor through said segment line.

Claim 33. The apparatus of claim 32 characterized in that said locating means utilizes multiple positioning rolls, multiple segments, and multiple perpendiculars.

Claim 34. The apparatus of claim 25 wherein the member is a rotor with main lines of action in respect to a certain valley and characterized in that said locating means utilizes points of contact within said main lines of action.

Claim 35. The apparatus of claim 25 wherein the member is a rotor with main lines of action in respect to a certain valley and characterized in that said locating means utilizes points of contact at said main lines of action.

Claim 36. The apparatus of claim 25 wherein the member is a rotor with main lines of action in respect to a certain valley and characterized in that said locating means utilizes points of contact are outside of said main lines of action.

Claim 37. The apparatus of claim 25 characterized by an additional developed surface and an additional positioning roll and said locating means utilizes said additional positioning roll having a one point contact with said additional developed surface.

Claim 38. An improvement for an apparatus using a formed grinding wheel to grind a member having an external developed surface with at least two segments,

the improvement comprising means for connecting the formed grinding wheel to the apparatus, a location means to locate one segment of the developed surface with a positioning roll connected to a moveable clamp,

grinding means to rough ground one segment of said developed surface as a reference surface prior to production grinding the different segment of the developed surface,

and means to operate the formed grinding wheel to grind a different segment of the developed surface.



Claim 39. An improvement for an apparatus using a formed grinding wheel to grind a member having an external developed surface with at least two segments,

there are two positioning rolls, the member has first and second segments of the developed surface and at least a third segment of the developed surface,

the improvement comprising means for connecting the formed grinding wheel to the apparatus, a location means to locate one segment of the developed surface with a positioning roll connected to a moveable clamp,

means for locating the first and second segments in succession for grinding, means for engaging the first and second segments with the positioning rolls respectively before grinding the third segment,

and means to operate the formed grinding wheel to grind a different segment of the developed surface.

Claim 40. The apparatus of claim 39 wherein a finished segment has a certain size and characterized in that the first and second segments are ground oversized as reference grinds while the third segment is ground as a finished segment of its certain size.

Claim 41. The apparatus of claim 39 characterized in that the two positioning rolls are angularly spaced by a certain number of degrees and the first and second segments are angularly spaced by the same number of degrees for engagement therewith prior to grinding the third segment.

Claim 42. The apparatus of claim 41 characterized in that the third segment is adjacent to one of the first or second segment.

Claim 43. The apparatus of claim 39 characterized means to angularly space the first and second segments by substantially  $180^{\circ}$ .

Claim 44. The apparatus of claim 40 characterized by the addition of an index means and wherein the member has a fourth segment and after the third segment is ground the index means are utilized such that the two positioning rolls are engaged with differing surfaces of the first and second segments respectively prior to grinding the fourth segment.

Claim 45. The apparatus of claim 44 wherein the member has a fifth segment and after the fourth segment is ground,

the index means indexes the member such that the two positioning rolls are engaged with the third and fourth segments prior to grinding the fifth segment.

Claim 46. The apparatus of claim 45 characterized in that the index means has two positioning pieces and wherein the member has a sixth segment and after the fifth segment is ground,

the index means indexes the member such that the two positioning pieces are engaged with differing surfaces of the fourth and fifth segments respectively prior to grinding the sixth segment.

Claim 47. The apparatus of claim 45 characterized in that the first and second segments are coextensive with the fifth and sixth segments.

Claim 48. The apparatus of claim 45 wherein the index means has two positioning pieces and characterized by engagement means for engaging the fifth and sixth segments with the two positioning pieces prior to regrinding one of the first or second segments.

Claim 49. The apparatus of claim 24 using a formed grinding wheel to grind a member having an external developed surface with at least three segments,

the improvement of locating means for locating and retaining two segments of the developed surface with positioning rolls connected to a moveable clamp and then using a grinding means to grind a different segment of the developed surface.

Claim 50. The apparatus of claim 24 using a formed grinding wheel to grind a member having an external developed surface with at least three segments,

there are two segments of the developed surface having a valley having a size the improvement of locating means for locating two segments of the developed surface with positioning rolls connected to a moveable clamp,

the positioning rolls engaging same respectively have a size greater than the size of the valley with such positioning rolls having a two point contact with such valley, and then using a grinding means to grind a different segment of the developed surface.

Claim 51. An improvement for an apparatus using a formed grinding wheel to grind a member having an external developed surface with at least four segments,

the improvement comprising means for connecting the formed grinding wheel to the apparatus, a location means to locate one segment of the developed surface with a positioning roll connected to a moveable clamp,

means for locating and retaining three segments of the developed surface with positioning rolls connected to a moveable clamp means to operate the formed grinding wheel to grind a different segment of the developed surface,

and using a grinding means to grind a different segment of the developed surface.

Claim 52. The apparatus of claim 51 wherein there are three segments of the developed surface having a valley having a size and characterized in that the positioning rolls engaging same respectively have a size greater than the size of the valley with such positioning rolls having a two point contact with such valley.

Claim 53. The apparatus of claim 52 wherein the member has a seventh segment and indexing means to index the member after the sixth segment is ground,

such that the two positioning rolls are engaged with the fifth and sixth segments prior to grinding the seventh segment.

Claim 54. The apparatus of claim 53 wherein the member has a eighth segment and indexing means to index the member after the seventh segment is ground,

to index the member such that the positioning pieces are engaged with differing surfaces of the fifth and sixth segments respectively prior to grinding the eighth segment.

Claim 55. The apparatus of claim 54 characterized in that the first and second segments are coextensive with the seventh and eighth segments.

Claim 56. An apparatus for positioning a member having a developed surface in respect to a grinding wheel, the developed surface including a segment,

the apparatus including a fixture, said fixture being larger than the segment, and engagement means to engage said fixture with the segment at only two points in a direction substantially perpendicular to a line through said two points to retain the member in respect to the grinding wheel.

Claim 57. The apparatus of claim 56 characterized in that said engagement means includes movement of said fixture.

Claim 58 cancelled 6/20/3.

Claim 59. An apparatus for positioning a member having a developed surface in respect to a grinding wheel having an engagement angle, the developed surface including a segment,

the apparatus including a fixture and engagement means to engage said fixture with the segment in a direction substantially perpendicular to the engagement angle of the grinding wheel to retain the member in respect to the grinding wheel,

and means to move the grinding wheel to grind oversized reference grinds until one such reference grind is in engagement with said fixture.

Claim 60. An apparatus for positioning a member having a segment of a developed surface,

the apparatus including a positioning fixture and said positioning fixture contacting the segment at only two points to position and retain the member in the apparatus.

Claim 61. The apparatus of claim 60 characterized in that said positioning fixture includes a roll in contact with the segment at said only two points.

Claim 62. An apparatus for positioning a member having a segment of a developed surface,  
the apparatus including a positioning fixture, said positioning fixture including a roll contacting the segment at only two points,  
the segment has a size and said roll having a size greater than the size of the segment.

Claim 63. The apparatus of claim 62 characterized in that said positioning fixture is external to the segment.

Claim 64. An apparatus of claim 62 wherein the member is a rotor having main lines of action and characterized in that said two points of contact are located within said main lines of action.

Claim 65. An improvement for an apparatus for positioning a rotor having a valley inclusive segment, the valley having a size,



the improvement of a positioning roll, said positioning roll having a size, said size of said positioning roll being greater than the size of the valley and said positioning roll being in contact with the valley to position the rotor to position and retain the rotor in the apparatus.

Claim 66. A contact for retaining a rotor in respect to an arbor, the rotor having a non-circular external developed surface with at least two segments with a valley therebetween, the segments having a valley radius and an end surface,

the contact surface comprising a washer, said washer being smaller than the valley radius of the rotor, and said washer being in contact with the end surface of the rotor to retain it in respect to the arbor.